



National Aeronautics and
Space Administration

ASAP

Aerospace Safety Advisory Panel



Second Quarter



National Aeronautics and
Space Administration

Headquarters
Washington, DC 20546-0001



Q-1

May 2004

The Honorable Sean O'Keefe
Administrator
National Aeronautics and Space Administration
Washington, DC 20546

Dear Mr. O'Keefe:

The Aerospace Safety Advisory Panel has been together for 4 months now and has met together formally twice. Panel members also have participated in several key NASA activities such as the Service Life Extension Program Summit, a Stafford-Covey Return to Flight (RTF) Task Group meeting, and a Shuttle Program Management Review. We stay informed on almost a daily basis of major activity taking place within the Agency.

Building on the work of the Columbia Accident Investigation Board (CAIB) and the RTF Task Group, the panel is dedicated to ensuring safety advances and positive cultural change have "staying power." While we shall not fail to alert you to discovery of imminent or potential danger, we believe we best serve NASA and the Nation by taking a long-term view.

We invite your special attention to our questions and recommendations regarding implementation of the Independent Technical Authority (ITA). We endorse and commend the decision to implement ITA and Safety and Mission Assurance organizational changes recommended by the CAIB prior to launch of the next Space Shuttle.

Cordially,

A handwritten signature in black ink, appearing to read "J. W. Dyer". The signature is fluid and cursive, written over a light gray circular stamp.

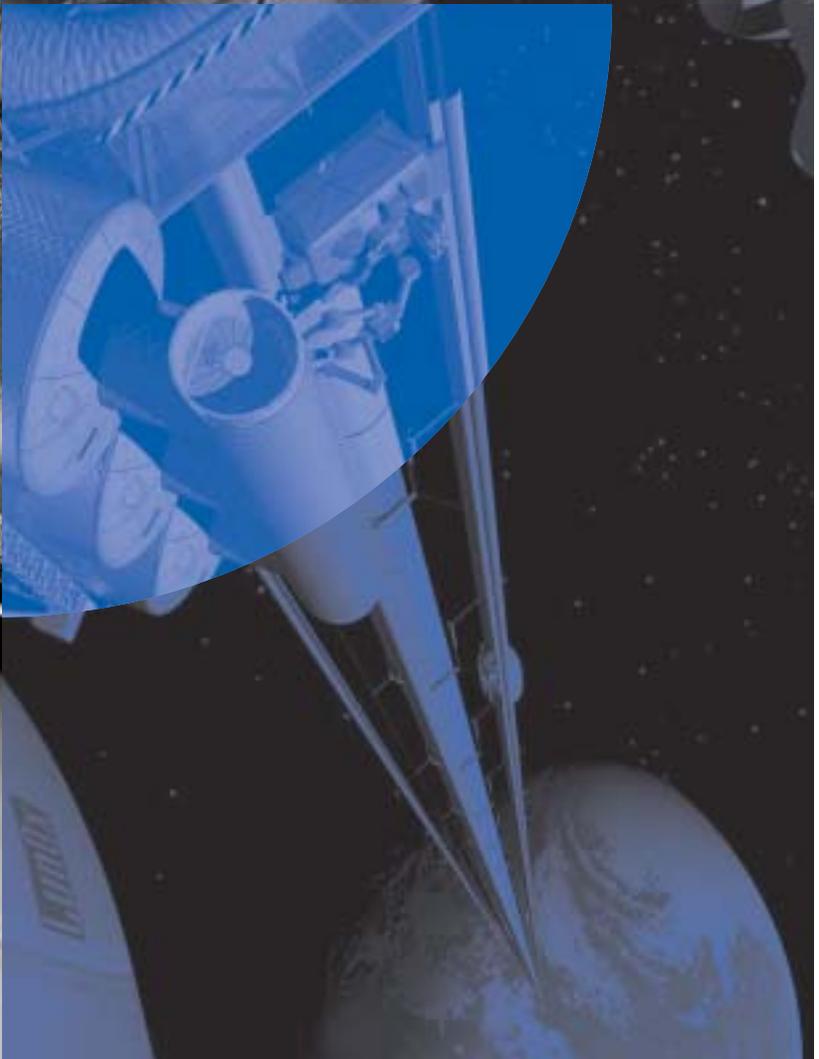
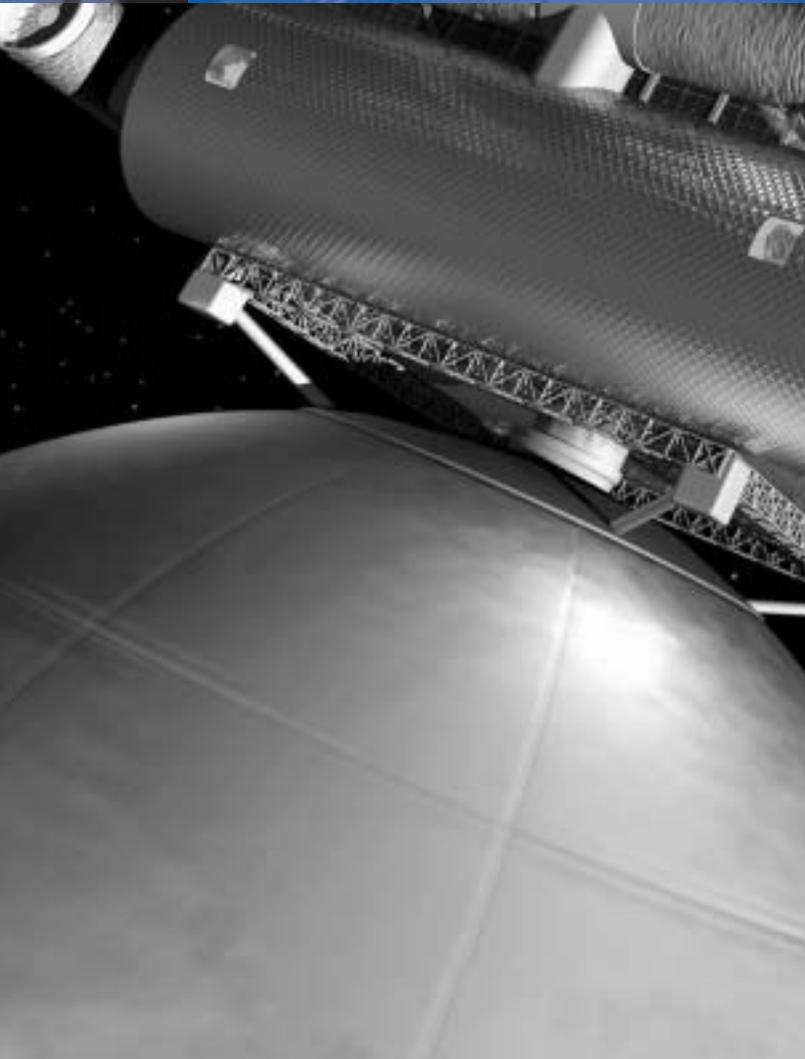
Joseph W. Dyer, VADM, USN (Ret)
Chair
Aerospace Safety Advisory Panel



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I. Introduction

This is the Second Quarterly Report for the newly reconstituted Aerospace Safety Advisory Panel. The NASA Administrator rechartered the panel on November 18, 2003, to provide an independent, vigilant, and long-term oversight of NASA's safety policies and programs well beyond Return to Flight of the Space Shuttle.



II. Second Quarterly Meeting Minutes





National Aeronautics and Space Administration

**AEROSPACE SAFETY ADVISORY PANEL
PUBLIC MEETING**

January 29, 2004

**NASA Headquarters
Washington, DC**

MEETING MINUTES

Mark D. Erminger
Executive Director

VADM Joseph W. Dyer, USN (Ret)
Panel Chair

**AEROSPACE SAFETY ADVISORY PANEL (ASAP)
PUBLIC MEETING**

April 8, 2004

**NASA Headquarters
Washington, DC**

Panel Attendees

VADM Joseph W. Dyer, USN (Ret), Chair

RADM Walter H. Cantrell, USN (Ret)

Dr. Augustine O. Esogbue

Maj Gen Francis C. Gideon, Jr., USAF (Ret)

Ms. Deborah L. Grubbe

Mr. John C. Marshall

Dr. Rosemary O'Leary

Mr. Steven B. Wallace

Mr. Rick E. Williams

BG Joseph A. Smith, U.S. Army, Ex-Officio Member

Mr. Mark D. Erminger, Executive Director

The first 30 minutes of the meeting were reserved for public comment on safety in NASA. No members of the public requested time to make a public comment, and no members of the public submitted any written comments.

INTRODUCTION

Admiral Joe Dyer opened the meeting and introduced two of the Panel members who did not participate in the previous public meeting, General Joe Smith and Dr. Rosemary O'Leary. General Smith and Dr. O'Leary introduced themselves and briefly described their backgrounds.

Admiral Dyer outlined the topics to be discussed in the public meeting and then introduced individual Panel members to discuss each of the topics.



DUPONT SAFETY AND ENGINEERING

Ms. Deborah Grubbe summarized her presentation to the Panel on how DuPont performs safety and engineering.

She discussed the DuPont Safety, Health, and Environment (SHE) Excellence Center and DuPont Engineering organizational structure processes and system. There are independent reporting lines between the Vice President of Safety, Health, and Environment, and others in the corporation who control the money. There are independent reporting lines between the Vice President of Engineering and those who control the money. Both of these organizations have independent budgets. The people in these organizations have full-time assignments. The managers of each of these organizations run independent work processes and systems. These work processes involve the people with the money as part of a collaborative decision-making process as part of the management system. The work systems are defined and documented. They have key decision points where all stakeholders must be involved in the decision. DuPont has a rigorous internal audit process and uses an annual independent third-party audit to verify that both organizations do what they say they are going to do. Both organizations serve a larger organization of over 150,000 employees and contractors and ensure adherence to internal standards, guidelines, and procedures.

DuPont work processes are centered, not centralized. They use the same process in multiple places the same way.

The existence of the DuPont SHE Excellence Center and DuPont Engineering ensures a healthier balance of power between the people who have the money and the people who have the technical knowledge.

When Ms. Grubbe looks at the current evolution of independent safety and engineering organizations and the evolution of independent technical authority in NASA, it is not clear that NASA is establishing the appropriate balance of power. It is important that this balance occurs quickly.

Admiral Dyer commented that space flight is only 50 years old, aviation is 100 years old, and DuPont is a 200-year-old company working on how to be successful for the next 100 years.

Ms. Grubbe reiterated a point that Mr. Rick Williams made earlier about the need for transparency of work processes and the benefits of transparency.

Mr. Steve Wallace asked Ms. Grubbe to explain the upside-down DuPont organization chart. She said that DuPont only makes money when the customers pay. The customers are at the top. The Chief Executive Officer is at the bottom.

Admiral Walt Cantrell observed that while you don't normally see that kind of chart, it passes the authority, accountability, and assurance of compliance tests.

INDEPENDENT TECHNICAL AUTHORITY (ITA) AND SAFETY ORGANIZATION

Admiral Dyer summarized the Panel's discussions on ITA with the Associate Administrator for Safety and Mission Assurance, Mr. Bryan O'Connor.

Admiral Dyer found Mr. O'Connor to be a consummate professional and appreciated his frankness and openness.

Mr. O'Connor spoke on several topics.

He talked about ITA and did a good job of describing his understanding of it. He described a process to manage safety-related technical standards and to conduct planning and independent assessment.

The Panel feels that the ITA is also directly related to cost and schedule. If not expeditiously resolved, critical technical decisions could impact cost or schedule.



Other issues are clearing, but not clear. For example:

- Where will technical authority be vested?
 - Is it to be exercised at Headquarters, Center(s), or some combination with dual reporting?

It is the Panel's perception that it is tending toward some delegation of authority to the Centers.

The Panel would like to get a better understanding of where NASA was, is, and is going to be with the location and execution of technical authority. This also applies to safety structure and to the changing of cultures. Using the hermit crab analogy, the crab shouldn't spend too much time outside of the old shell while looking for a new shell. Another area of uncertainty is the role of Centers and Center Directors. Some people in NASA feel the Center Directors are too powerful, and others feel they are not powerful enough.

The Panel hopes to see an expedited effort to resolve these issues.

Mr. John Marshall commented that there are a lot of organizations trying to give NASA direction and that makes it difficult to reach closure.

Mr. Williams said that the amount of time it takes to reach clarity and decisions sends a signal to the organization on the importance of the issue.

Mr. Steve Wallace said that Mr. O'Connor did a good job of describing where NASA is. ASAP doesn't want to be added to the list of groups that have to approve the ITA concept and the S&MA organization. The Stafford-Covey RTF Task Group has a role. ASAP is an interested observer.

OFFICE OF SPACE FLIGHT (OSF)

General Rusty Gideon summarized the Panel's discussion on the OSF.

General Michael Kostelnik is responsible for the Shuttle and Station Programs. General Kostelnik told the Panel that the NASA Engineering and Safety Center (NESC) along with ITA are helpful structural changes and that independent funding is a good thing. General Kostelnik had a lengthy discussion with the Panel on problems and technical issues related to the next Space Shuttle mission. OV-103 and OV-104 processing is going well as far as technical improvements. Imaging and telemetry systems quality and quantity will be enhanced for flights in the future. He said that there are no problems in software, funding, or staffing. He is working hard to ensure the correct balance between “nice to have” improvements and mandatory RTF improvements. So far he has not had to ask the NASA Chief Engineer to resolve technical issues. The Panel asked General Kostelnik about the Center Director involvement in the program. He said that procedures are still being developed and that having new directors in the field will help. There is a new emphasis in NASA on developing successful leaders. Some disciplines are only one person deep. NASA is attempting to move away from Center-centric authority and control. NASA needs leaders, not just managers. It does take time to change culture. Known Shuttle problems and known-unknown problems are being worked well, but an unknown-unknown problem could cause a delay.

Mr. Wallace commented that General Kostelnik was very engaged and knowledgeable on hardware issues.

Mr. Marshall commented that General Kostelnik has hands-on knowledge and is deeply involved in every single aspect. You walk away with a confidence that things are moving in the right way. He felt confident that the right emphasis is being applied. Budgetary issues have not been a determining factor on any RTF items.

Admiral Dyer commented that NASA's ability to deal with technical problems or engineering challenges once they have been identified is outstanding.

Mr. Williams said that in terms of changes inside the Shuttle Program, they used the NESC for a third-party opinion on the rudder speed brake grease x-ray question.



Dr. Augustine Esobue commented that RTF is not driven by technical issues but by people. The human element is unpredictable.

INTERNATIONAL SPACE STATION (ISS)

Mr. Williams summarized the Panel discussion on the ISS.

There are some interesting facts on the ISS. Fifty-five percent of the ISS is deployed by weight, six elements are ready to go at Kennedy Space Center, and Expedition 8 is returning this month. Expedition 9 is deploying in April and returning in October.

The ISS challenges are in three categories: current issues, issues after Shuttle RTF, and the long-term post-Shuttle retirement impacts on logistics to ISS.

As far as current logistics, the Shuttle is grounded, they have reduced lift capacity, and water is the major constraint. The other near-term issue is with continued maintenance on the oxygen life-support system. They successfully completed a two-person Extra-Vehicular Activity, and two more are planned. Their challenge after RTF is completing construction of the ISS. Other issues include motion control while the ISS is asymmetrical and management of the hardware and software data system with a growing demand for data.

Finally, what will logistics look like after Shuttle? What role will ISS play in future space exploration? Will it involve a commercial vehicle interface?

Like all exploration, there are inherent risks that have to be faced. The ISS has tools in place to measure risk using a 5-by-5 matrix quantifying likelihood and consequence. NASA seems to have their arms around the issues that ISS faces in both near term and long term. There are challenges, but there are lots of examples where the systems are working flawlessly.

Admiral Dyer observed that the ISS briefings were impressive in terms of the data presented, and he came away feeling good about the close quantitative attention that is being paid to the management of ISS.

OFFICE OF AERONAUTICS

Mr. Marshall summarized the Panel discussion on the Office of Aeronautics.

The Panel received an orientation presentation along with a high-level review of Office of aeronautics mission objectives. The Panel charter extends beyond space and into the aeronautical side to ensure that the cultural changes and safety promulgate through the entire organization. The Associate Administrator for Aeronautics, Dr. Vic Lebacqz, discussed the Office's mission and vision in NASA. He discussed the Office's organizational structure and the four Centers for which the Office is responsible. He also talked about the budget from 2004 through 2009. The Office's budget was not significantly impacted, but there was no adjustment for inflation. He cited four examples for the new direction in aeronautics: mitigation of sonic booms, scram jet demonstration, Helios, and regional environmental surveys. NASA continues to contribute to the air transportation system. If NASA is not doing it, who would? The answer is "nobody."

The Panel requested additional information on the methodology for developing priorities and a document that outlines the strategic planning process. The Panel will schedule future meetings with this Office.

The budget continues to erode in this area. Aircraft accident rates are low, but NASA needs long-term sustainable reinvestment to continue the safety performance that is enjoyed today.

Admiral Dyer commented and acknowledged his bias in this area. He did a technology survey through Western Europe and was impressed with the technology he saw. Several years ago, the United States moved scientific and technical funding from the Department of Defense to NASA. Over the years, the budget has gone down 50 percent. He believes this investment is important economically to the country.



Dr. Rosemary O'Leary commented that safety and air traffic control innovations affect everyone around the world.

Dr. Esogbue commented that some gains had impact on safety through inducing investment in new technologies.

SERVICE LIFE EXTENSION PROGRAM (SLEP)

Admiral Cantrell summarized the Panel discussion on the SLEP.

Mr. Marshall, General Gideon, and Admiral Cantrell attended the second SLEP Summit in Galveston, TX. All the presentations were posted on the SLEP Web site. The first Summit was held immediately after the Columbia Accident. This Summit occurred shortly after the President's budget and vision change was announced. The objective for the Space Shuttle changed from operating safely until 2020 to keeping it flying safely and reliably to 2010 or so. The ASAP interest is in what SLEP is doing as a contribution to safe and reliable operations on RTE. Of the eight panels, safety is embedded in primarily four panels. Safety is under the Sustainability Panel that is chartered with maintaining the current level of safety and the Safety Panel that deals with needed safety improvements. The Transition Panel deals with the incorporation of the CAIB recommendations. The Integration Panel integrates the efforts of all the panels. The SLEP panel reports focused on technical items and known-unknowns to channel the work to date to be able to say that its portion of the program has done the things necessary for safe return to flight. The bottom line is that safety is being given the appropriate attention.

General Gideon said that NASA has said they will retire three safe Shuttles and that the last mission will be as safe as it can possibly be.

Mr. Wallace said that General Kostelnik said several times that he was going to retire three safe Shuttles and that was a concern of the CAIB. The CAIB wrote a recommendation that the Shuttle be recertified to fly past 2010, but, had it known the Shuttle

wouldn't fly past 2010, the CAIB would have said to not let the Shuttle deteriorate prior to the last mission.

CONCLUSION

Admiral Dyer concluded the discussion and identified some take-aways from the discussion. Some are observations and some are statements in need of further research.

- The Panel agreed that NASA challenges are more cultural than technical improvements.
- Dr. O'Leary commented that while there is a need to move forward at a rapid pace, there is also a realization that organizational change and cultural change take a long time. It is a slow process that doesn't happen over night. This is something that the Panel would like to check on periodically over a long period of time.
- The Panel recommended the following question for further research, discussion, and contemplation. Is NASA attempting to make lasting cultural change while at the same time minimizing organizational modifications? If so, are these two goals compatible?

General Gideon commented that too often in big bureaucracies, changing organizational blocks on a piece of paper is touted as the solution to a problem, without achieving any real change.

- The Panel noted that it had worked on better defining its role. It certainly believes that its responsibilities are to advise the Administrator over the totality of NASA's mission area and to do so in the long term. The Panel sees a responsibility to look not only at what is closest to the fire but to look at long-term sustainability.



The Panel talked extensively about technical authority, as well as safety structure and culture.

Ms. Grubbe added that the Panel also talked about the concept of the need for leadership doing the right things and the need for management doing the right things the right way. There must be an appropriate discussion and understanding of accountabilities. The question that must be asked is “Who is accountable for what and at what time in the process of doing the work and doing it safely?”

- Since the Panel meets quarterly, what progress does it note on a meeting-to-meeting basis? The Panel hoped to see more progress. The important organizational issues are queued up. The issues are clearing but not clear. The Panel is interested in discussion of “One NASA.” The Panel believes there is some excellent work going on, but finishing the work is important.

Mr. Steve Wallace commented that “safety” is part of the ASAP name. It is across the board safety. Everyone is focused on Shuttle, and so is ASAP. The CAIB organizational recommendations that came up repeatedly are directed at the Shuttle Program. That is appropriately the major focus, but, in the long-term, there are safety issues to be addressed across all of NASA. According to the Charter, that is on what the ASAP is to advise the Administrator.

MEETING ADJOURNED

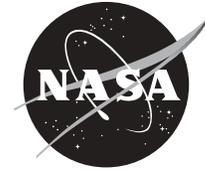
Admiral Dyer adjourned the meeting and opened the floor to questions from the public attending the meeting.





National Aeronautics and
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Headquarters
Washington, DC 20546-0001



Q-1

May 27, 2004

The Honorable Sean O'Keefe
Administrator
National Aeronautics and Space Administration
Washington, DC 20546

Dear Mr. O'Keefe:

The Aerospace Safety Advisory Panel will be making one recommendation and one endorsement to you in our Second Quarterly Report.

Recommendation

The Panel recommends NASA's Chief Engineer perform an assessment of Independent Technical Authority (ITA) implementation planning by the Office of Space Flight as it applies to the Space Shuttle Program, the International Space Station Program, and the Safety and Mission Assurance (S&MA) organization. Specifically, we recommend this assessment describe what "was," what "is," and what "will be" the state in each of these three applicable areas in light of your April 13, 2004 letter to the NASA Chief Engineer regarding "Actions to Establish NASA Engineering Organizational Structure." We request that the Chief Engineer present a written summary of his findings to the Panel by July 1, 2004. Additionally, we request the Chief Engineer brief his findings and planning to the Panel at our July 28, 2004 Quarterly Meeting.

We believe answers to questions such as the following will assist the Panel in better understanding the approach to implementing ITA and its interface within the evolving NASA safety culture:

- Who is the technical authority (i.e., who shall have overall responsibility, accountability, and authority to administrator ITA)?
- What are the key functional areas making up the ITA?
- Who are the representative subject-matter experts assigned to lead key areas?

Where do they reside?

To whom do they report?

Who signs their performance evaluations?

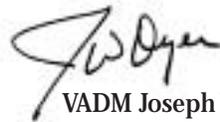
Who can override their direction?

- What are the reporting, evaluating, and oversight relationships between the functional leaders/ITA and matrix personnel (e.g., between the head structural engineer holding ITA authority for structures and structural engineers assigned to program teams)? This is important because the individuals assigned to the program teams must feel the responsibility and accountability of “good technical conscience” (i.e., there must be a linkage between engineers assigned to the team and to the technical authority if necessary insight is to be achieved).
- Is a lead functional/ITA person responsible for the long-term career development and continuing education of ALL the people within his/her functional area? Is this responsibility independent of geography, or are there multiple people at multiple sites? If a single ITA functional lead does not have this responsibility, accountability, and authority all across NASA, how is it exercised at the Agency level? If distributed, how is it integrated?
- If there is dual reporting, is there a feedback loop? How are disagreements resolved?

Endorsement

The Panel endorses NASA's plans to implement the ITA and S&MA organizational changes recommended by the Columbia Accident Investigation Board prior to Return to Flight of the Space Shuttle.

Sincerely,



VADM Joseph W. Dyer USN (Ret)

Chair

Aerospace Safety Advisory Panel

cc:

D/Mr. Bradley

M/Mr. Readdy

Q/Mr. O'Connor